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ABSTRACT

Intended for coordinators of performing arts organizations who want to make their programs accessible to hearing impaired persons, the booklet presents a general overview of Project HEAR (Hearing Electronics Arts Research) and step-by-step instructions for establishing an access program. Information is provided in question-and-answer format. An introductory section (part 1) points out that equipment and the logistics of service delivery need to be addressed in providing access for the hearing impaired adult population. Part 2 addresses the social effect of hearing impairment, the prevalence of hearing impairment, and specific needs of a hearing impaired person attending an arts performance. Part 3 describes the efforts of the Buffalo Philharmonic Orchestra in making its program more accessible to the hearing impaired. Three major components to the Buffalo program include instrumentation, installation, and logistics. Instrumentation is described in terms of the FM system, other amplification systems available on the market, and infrared audio transmission systems. Installation topics considered include types of installation methods, use of multiple microphones, the role of the mix/amplifier, the FM microphone/transmitter, and maintenance requirements. Logistics is discussed in terms of funding, audience development, dispensing of equipment, children's performances, and program assessment. Appended is information on the maintenance and care of the FM Phonic Ear, the procedure for a children's series concert, a sample FM system malfunction record form, a list of major manufacturers of auditory training equipment, a hearing impaired patron's evaluation questionnaire, a sample letter and post-concert evaluation form, and a list of additional sources of funding. (SW)

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OPENING EARS to the PERFORMING

A Guide To Serving The Hearing Impaired

A Special Project Of The
BUFFALO PHILHARMONIC ORCHESTRA

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Lori Jones tries on her Buffalo Philharmonic audiological training equipment, and hears music, for the first time.

Photo credit: Robert Travers

OPENING EARS TO THE PERFORMING ARTS:
A GUIDE TO SERVING THE HEARING IMPAIRED

by

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I INTRODUCTION

Question: **What is the purpose of this booklet?**

Answer: This booklet is designed for coordinators of performing arts organizations who want to make their programs accessible to hearing impaired persons. The text presents a general overview of the nature of the task and step-by-step instructions for establishing an access program.

Question: **Where did this information come from?**

Answer: The methods developed for this "how to" booklet were derived from two years of research conducted by the Buffalo Philharmonic Orchestra. This book was funded by the National Committee * Arts for the Handicapped. The research project, called Project HEAR (Hearing Electronics Arts Research), received funds from the National Endowment for the Arts. It was directed by Ruth L. Spero, Executive Director, Buffalo Philharmonic Orchestra; conducted by Charles Burdette, Coordinator, with assistance from Derek Sanders, Ph.D., Consultant audiologist from the Department of Communicative Disorders and Sciences, State University of New York at Buffalo. This research team will be available to assist you in establishing and implementing your program.

Question: **What are the major components of an access program for the hearing impaired?**

Answer: Experience has shown that to provide access for the hearing impaired adult population, two major areas have to be addressed: 1) equipment and 2) the logistics of service delivery. When school-aged children are included in the target population, it is desirable to add a third component linking the service to the educational curriculum of their schools.

II THE NEED

Question: **What social effect does hearing impairment have?**

Answer: A history of public treatment of handicapped people in general indicates that it has ranged from passive neglect to active discrimination. This treatment has extended to persons with varying degrees of hearing impairment. Institutional services to this group of people have focused almost exclusively on providing formal education. Until recently, even in education, the rule has been to segregate the severely hearing impaired in special schools. Thus, from early childhood, isolation from the social mainstream has been common. The adult with impaired hearing has been subject in some ways to an even more distressing experience. Those who are congenitally severely deaf often have found social satisfaction only in clubs for the deaf. Those with less severe impairment, particularly with progressive deficits, have found themselves increasingly isolated from the normal social life they have come to share with family and friends. Hearing impairment thus becomes a barrier to community involvement.

Enjoyment of the performing arts is frequently one of the pleasures most seriously missed by those who lose their hearing.

The adult hearing impaired population can be divided into those who, by virtue of their hearing problem, have not had the experience of attending arts performances, and those who have had to cease attending because of increased impairment. This booklet seeks to serve people in both categories.

Individuals concerned with reducing the social impact of handicapping conditions need to recognize that the disability constitutes a potential handicap, not only for the disabled person but also for his or her family. The inability of a hearing impaired person to enjoy an arts performance usually means that the family is likely to join him or her in not attending that performance.

Question: **Are arts agencies legally required to serve the needs of hearing impaired persons?**

Answer: Yes, if the arts organization is receiving federal assistance. If they are, they must be in compliance with Section 504 of the Rehabilitation Act of PL92-112. The law states: "No otherwise qualified handicapped individual in the United States shall, solely by reason of his or her handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."

Question: **How prevalent is hearing impairment?**

Answer: In the book, *The Deaf Population of the United States*, Schein and Delk, Jr. who were, respectively, Director and Coordinator of the Deafness Research and Training Center at New York University, state that hearing impairment is the single most prevalent chronic physical disability in the United States. The size of the hearing impaired population in the United States is estimated at 13.4 million. Of these, 1.8 million are deaf. About 0.4 million of these became deaf before 19 years of age. According to a study conducted by Schein and Delk in 1971, New York State alone has 1,074,764 hearing impaired individuals, a figure topped only by the State of California with 1,427,928 individuals; ages 6-16 have the third largest prevalence of hearing impairment and individuals 65 years and older, the highest. Schein and Delk point out: "Several factors indicate a greater prevalence with the next few years. First of all, persons are living longer which allows for more presbycusis.* Secondly, noise levels have continued to grow in our cities and our population has become more urbanized, therefore increasing hearing impairment due to acoustic trauma. Improved medical care in the short run will probably, as in the case of deafness, result in more hearing loss by saving from death persons assaulted by various diseases and injuries. It would appear, then, that the available data point to increasing prevalence rates for hearing impairment and deafness."

Question. **What section of this population can potentially be served by arts agencies?**

Answer: The research of the Buffalo Philharmonic Orchestra has demonstrated that previous assumptions concerning hearing impaired persons' ability to derive pleasure from attendance at concerts have not been based on fact. The research findings indicate that severity of hearing loss is not an adequate guide to a person's potential for

*A condition by which aging causes increasing hearing impairment and deteriorating speech discrimination.

enjoying music. A high correlation exists between speech comprehension and degree of hearing impairment. This relates to the complexities of spoken language. Music enjoyment, however, is more affective than speech and is analyzed in the opposite hemisphere of the brain. The essential constituents for music enjoyment have yet to be determined. The Buffalo Philharmonic research team, therefore, recommends the following definition of the hearing impaired population to be served: "The population to be served includes all individuals whose hearing deviates sufficiently from the normal population's as to result in any form of communication and/or social limitation." No upper limits are placed on this definition since there is no evidence to prove or disprove that a certain minimal level of residual hearing is necessary in order to appreciate music.

Question: **What are the specific needs of a hearing impaired person attending an arts performance?**

Answer: Hearing impaired persons' needs should be considered in terms of those they share with the hearing population and those arising specifically from their hearing handicaps. The needs have been identified, in order of importance, as follows:

1) Amplification to permit him or her to hear the performance loudly and clearly enough

2) Ability to control the volume of the performance

3) Optimal seating for visual appreciation of the performance

4) The ability to select from open seating so as to be differentiated as little as possible from the rest of the audience

5) Cosmetically acceptable amplification equipment

6) Complete mobility.

III HOW THE PROGRAM WORKS

Question: **How did this project begin?**

Answer: The Buffalo Philharmonic Orchestra, recognizing the need to make its programs more accessible to the hearing impaired, began work on a project to determine in what ways this need could be filled. Emphasis was placed on developing a research project with clearly defined parameters and carefully delineated procedures. The Buffalo Philharmonic was the first orchestra to approach the problem in a scientific manner.

The Buffalo Philharmonic is completing the second year of research supported by matching funds from the National Endowment for the Arts. In its project, the Philharmonic has systematically explored the instrumentation and logistics most effective in providing for the needs of the actual or prospective concertgoer handicapped by a hearing impairment. A team of specialists representing music, audiology,

electronics, acoustics and education, backed by persons with a representative range of hearing deficits, and by the parents of the hearing impaired children, has worked cooperatively for two years.

The experience gained has permitted the Philharmonic to develop an audiovisual kit explaining how similar services can be established by other arts organizations. When completed, this kit, used with the support of a selected local advisory team, and the involvement of a cooperative house technician, will insure effective service with minimal expenditure of time and money.

Question: **What specific issues must be addressed?**

Answer: The major components of an access service to permit the hearing impaired participate in concert performances are instrumentation, installation and logistics. These three components give rise to other questions.

A) INSTRUMENTATION

Question: **What type of equipment is recommended?**

Answer: The most practical, economic and flexible type of equipment for providing hearing impaired patrons with individualized concert hall amplification is a frequency-modulated system referred to as FM, or sometimes as RF (radio frequency).

Question: **How does an FM system work?**

Answer: Briefly, FM amplification systems work in this way: The unit consists of two major components, a

1) combination microphone/transmitter

2) receiver/amplifier

1) *The microphone/transmitter* Housed in a single casing, this component picks up the sound of the orchestra as well as any other sounds loud enough to activate the microphone. The soundwaves are converted to an electrical current at the microphone and then into radio waves which are carried into the hall by a transmitter. The quality of the signal transmitted is controlled to some extent by the quality of the microphone in the microphone/transmitter component.

It is possible to improve significantly the quality of the signal broadcast. This can be achieved by substituting high fidelity microphones, such as those used in a typical house system, for the lower-quality microphone provided with commercial amplification systems which are fed to a preamplifying mixer unit. Here, multiple input signals from several microphones are combined into a single signal. This signal is then fed to the FM transmitter through the auxiliary input jack on the microphone/transmitter component. The hall is thus flooded with a radio signal broadcast on a particular FM frequency. Hearing impaired patrons can tune into this radio signal by using the receiver component of the FM system.

2) *Receiver/amplifier* This component is a combination of a radio receiver and a hearing aid. It is worn by the hearing impaired patron. The radio component receives the broadcast signal in the same manner as a regular FM radio. The signal is then amplified to a volume level controlled by the listener and fed to the earphone receiver(s) fitted to the ear(s) in an earmold.

Question: **Is this the only way in which the FM signal can be received?**

Answer: No. An alternative method can be used to send the signal to the listener. The output of the FM receiver/amplifier is used to conduct a signal into the listener's own ear-level hearing aid(s). For this to be possible, the listener's hearing aid must have a telephone switch. Turning on the telephone switch activates the telephone circuit and cuts out the external microphone of the aid, making it insensitive to environmental sound. The telephone circuit is sensitive to changes in the magnetic field.

A magnetic field is set up to receive the signal from the FM receiver/amplifier through a soft-wire loop connected to the FM receiver unit. This loop is worn inconspicuously around the neck of the listener. It may be worn under a jacket, if desired. The output from the receiver/amplifier is fed into the loop in the form of an electrical signal carrying the music patterns. The aid then converts these patterns into sound waves which are fed to the ear. The hearing aid controls further adjust the intensity and tone of the signal.

Question: **What other amplification systems are available on the market?**

Answer: Two other amplification systems are available. These are the

1) induction loop system

2) infrared light amplification system

1) *Induction Loop System*

The standard loop induction system does not use FM amplification at all. Instead, the microphone/amplifier/mixer components feed the output into a wire which surrounds an area within a concert hall or theatre. The changes in current within the wire set up an electro-magnetic field. The individual's personal hearing aid, set up on a telephone pick-up circuit, is sensitive to the pattern change. It amplifies and converts the changes into sound delivered to the ear by the hearing aid. This type of system should not be confused with the FM induction loop combination described above, though both systems utilize induction amplification of the same kind. The direct loop induction system has the following disadvantages:

a) It would be expensive and inefficient to loop an entire concert hall. The alternative is to loop only a section of the hall. This, however, results in segregating users in a special seating section, which defeats the principles of mainstreaming.

b) It deprives hearing impaired persons of purchasing tickets in any price range, since they must sit in the "looped" area.

c) It is subject to distortion and interference from a variety of sources, including fluorescent lighting.

d) It is not easy to insure the constancy of signal amplitude everywhere in the looped area.

2) *Infrared Transmission*

Question: **What are infrared audio transmission systems and how do they work?**

Answer: Microphones are placed in the auditorium in places appropriate for the performing arts event being amplified. The microphones feed the audio signal to a mixer and then to a specially designed amplifier. The amplified electrical signal then travels by wire to panels of infrared bulbs mounted above the stage and aimed at the audience. The infrared bulbs emit light in a frequency range not visible to the human eye. The amplified electrical signal, which carries the sound wave pattern, modulates the intensity of the light emitted by the infrared bulbs. In this way, the audio pattern is transmitted into the concert hall as a light wave pattern. The hearing impaired person is provided with a small battery powered infrared light receiver about the size of a cigarette packet. The lightweight receiver must be worn so that the light ray is blocked by nothing. Filtered lenses in each receiver allow only infrared light to pass into a light-sensitive (photo altaic) cell which recreates a modulated electrical current from the patterned infrared light waves. This current, equivalent to the original audio signal, is then amplified and converted back into sound, which is fed to the user's ear. Various models use different techniques for the conversion of the electrical wave to a sound pattern.

a) One model (the one the BPO has selected to use) houses the transducers which turn electrical current into sound in the body of the receiver units. The sound from the transducer is conducted to the ear via air tubes similar to the headsets used on airplanes to provide passengers with music and movie sound tracks.

b) Another model provides for the amplified signal to be fed to a transducer/receiver ear-insert similar to the kind used with body aids.

c) The audio signal can be connected via cable to a small plastic encased loop which fits behind the user's ear-level hearing aid. This is an induction system. It is dependent on the availability of a telephone switch ("T" switch) in the user's personal aid.

d) A fourth system incorporates the infrared pick-up amplifier in earphone headsets.

Question: **Do infrared systems have drawbacks?**

Answer: Infrared is a line-of-sight system. Any object which intervenes between the light wave beam and the receiver will impede reception. Thus, people or objects blocking the light ray, such as programs raised in front of the lens, can create interference in the form of a most unpleasant broad frequency noise. Furthermore, the signal cannot be received outdoors because sunlight contains strong infrared components which mask the infrared transmission signal.

No infrared system on the market today is rated by the Food and Drug Administration as a Class 2 medical device specifically designed for the hearing impaired. The sound pressure level is limited to approximately 90 decibels, confining the usefulness of infrared to persons with less than severe levels of hearing impairment. Most auditory training units designed for the hearing impaired are rated as Class 2 medical devices. The maximum sound pressure output levels of these auditory trainers often reach 140 decibels.

Senior citizens who might be classified as "hard of hearing" seem to gain great benefit from infrared systems. Most auditory training equipment designed for the hearing impaired has a very flat signal response curve. A person with an impairment in either high or low frequencies can turn the volume up to a level that accommodates their deficit without incurring discomfort in their better hearing range. No infrared equipment available today has this special response curve. The infrared equipment has a high fidelity type of response curve better suited for flat loss.

B) INSTALLATION

Question: **How can an FM amplification system be installed in an auditorium?**

Answer: A description of the methods and problems involved in installation necessitates a fuller description of the equipment.

The microphone/transmitters of commercially available FM auditory training units are approximate 7-1/4" long. The cases are molded in high impact plastic and have a 20" transmitter antenna cable attached at one end (Fig. 1). The basic internal components consist of a microphone, an amplifier, batteries and a crystal-based transmitting circuit. These units can transmit on any one of the 32 channels from 72 MHz to 76 MHz, depending on the crystals chosen. Fig. 2 shows some of the channels and color codes of the leading brands. The microphone/transmitters have on/off switches and one or two input jacks. One input jack provides for charging the battery. The other allows for auxiliary sound sources. The Phonic Ear brand provides a single input for both battery charge and auxiliary sound transmission.

Question: **What installation methods should be considered?**

Answer: There are several possibilities, depending on existing equipment.

1) *Installation Procedures for Organizations Lacking Amplification*

The first method is practical for organizations that do not have a house sound-amplification system. The frequency response range of existing FM auditory training systems was designed for reception of sound in the range of speech. This is because they were designed for educational purposes, not for listening to music. The microphone was designed to pick up sound at a distance no greater than 6" from the sound source. It has been our experience that, despite this apparent design limitation, the microphone/transmitter should be placed in a central position on stage. Persons with good residual hearing report that the quality of the signal picked up and broadcast in this manner is usually excellent.

It is impractical to hang this type of microphone since it is necessary to be able to turn the unit on or off just before or after the performance. This is essential to conserve battery current. Placing the microphone/transmitter on the base edge of the stage is also undesirable. This procedure results in picking up noises made by

Fig. 1 Typical FM Auditory Trainer, Microphone/Transmitters

FCC Assigned Frequency	Telex Earmark Bio-Coustics Zenetron	HC Electronics (Case/Dot)
72.025	1	red/gray
72.075	2	brown/gray
72.125	3	red/brown
72.175	4	brown/red
72.225	5	orange/gray
72.275	6	brown/orange
72.325	7	orange/brown
72.375	8	brown/yellow
72.425	9	yellow/gray
72.475	10	brown/green
72.525	11	yellow/pink
72.575	12	brown/blue
72.625	13	yellow/white
72.675	14	brown/pink
72.725	15	green/gray
72.775	16	brown/white
72.825	17	green/brown
72.875	18	black/gray
72.925	19	green/red
72.975	20	black/red
75.425	21	black/orange
75.475	22	green/yellow
75.575	23	black/yellow
75.575	24	green/blue
75.625	25	black/green
75.675	26	green/pink
75.725	27	black/blue
75.775	28	green/black
75.825	29	black/pink
75.875	30	pink/gray
75.925	31	black/white
75.975	32	pink/yellow

Fig. 2 Auditory Trainer Frequency Designations

the performers, or of equipment or instruments being moved on the stage floor. The method recommended is to tape the microphone/transmitters to a microphone stand with the antenna cable hanging down. For guidance in how to experiment with microphone placement, please refer to the diagrams in the next segment.

2) *Installation for Organizations Having a House Amplification System*

The second method of amplification is the preferred procedure for installation of microphones. The microphone/transmitter should be hooked to the output of the house amplification system. A house amplification system, like any amplification system, comprises three components, each representing a stage in sound reproduction. These components are the microphones, the amplifier and the speakers.

The microphones which pick up the signal in concert halls typically are mounted on stands placed on the stage. In some halls microphones are hung from the ceiling in positions over or near the stage. The dynamic range of these microphones, *i.e.*, the range of frequencies to which the instrument is receptive, is wide, extending well beyond the speech frequency range. A typical house microphone has a dynamic range from 40 Hz to 15 KHz, which accommodates the full range of music and speech.

Decisions about the placement of house microphones are usually the responsibility of the house audio technician. If there is no such technician available, microphones should be placed near the center of the air flow from the stage to guarantee better sound pick-up.

Question: **Can a single microphone be used?**

Answer: An orchestra is arranged in a semicircle to allow the conductor to hear a blend of all the instruments. This arrangement also proves to be the most effective for a single high-quality stand-mounted microphone. It should be placed at the edge of the stage, directly behind the conductor. This distance insures that the instruments, or voices of groups of singers, will blend because it permits the sounds to reach the microphone at approximately the same time and at the appropriate intensity. This avoids an unbalanced signal. The microphone should be played into the amplifier to which the microphone/transmitter of the FM unit is connected.

Questions: **What considerations should be made in using multiple microphones?**

Answer: When two or more microphones are used, they should be placed in balance. The output of the microphones should be fed to a mixer unit to blend the signals into a single output. Multiple microphones provide the advantage of allowing the intensity of the weaker sounds to be raised. In some concert halls, microphones are suspended from the ceiling. This affords greater flexibility in placing microphones. It is not essential that the microphones be hung directly over the stage. In some halls such placement may prove undesirable, causing a phenomenon known as "phase cancellation." Phase cancellation occurs when the direct sound waves from the sound source reach the microphones at a different time from the floor of the stage. The result is a muddy echo effect. It may prove desirable, therefore, to hang the microphone in front of the stage, over the first few rows of the audience. If one

of our goals is to give the hearing impaired listener the advance of "the best seat in the house," no matter where he is sitting, this may be one way to reach it.

Question: **What considerations govern microphone selection?**

Answer: Microphones vary in their sensitivity to sounds originating around them. Omnidirectional microphones have equal sensitivity through a full 360° range (Fig. 3). Directional microphones have sensitivity patterns which favor certain sounds and miss others. Their sensitivity can be varied by changing angles. The directional type microphone is known as a cardioid microphone for its heart shape. A typical cardioid sensitivity pattern is shown in Fig. 4.

A microphone with an omnidirectional sensitivity pattern is not often desirable for stage use. This kind of microphone is almost certainly less desirable for amplification for the hearing impaired because it picks up sounds from the audience as well as from the stage. Cardioid microphones prove superior to omnidirectional microphones for stage use. They can be positioned so that their area of maximum sensitivity is directed toward sounds emanating from the stage. The cardioid pattern drastically reduces extraneous audience sounds reaching it from the rear and side of the microphone. Coughing, feet shuffling and the rustling of programs will barely be heard through this microphone. Fig. 5 illustrates some desirable ways to place microphones.

Question: **What is the role of a mixer/amplifier?**

Answer: The purpose of a mixer/amplifier is to balance the signal levels from multiple microphones in order to reproduce the characteristics of the original sound. Once in balance, the relative intensity of weaker sound input levels can be increased, if desired. In so doing, care should be taken not to distort balance, since this will destroy the desired musical effect. Some mixers incorporate appropriate amplifiers. Others feed the blended sound signal to a separate amplifier. In situations calling for a single microphone, a mixer is not necessary because the microphone can be fed directly to an amplifier. But a mixer is essential if more than one microphone is used. The mixer and amplifier units in concert halls are commonly situated in a sound booth behind the audience, or are situated backstage.

Question: **What effect does the use of speakers at a performance have on a person listening with an FM unit?**

Answer: Speakers are not used as a component in amplification systems for the hearing impaired. However, when they are present as part of the program, or of the house system, they do impose certain constraints on the use of FM amplification systems. When speakers are used by the performers in a concert, hearing impaired persons using FM units should be seated towards the front of the auditorium. This is particularly important in larger halls. The reason for this is that the FM radio signal travels at the speed of light. While the airborne sounds from the speakers travel at a fraction of that speed, the time interval between the arrival of the radio frequency FM signal at the receiver units worn by the patrons and the live airborne signal must not be so great as to permit a discernible echo. The risk of echo increases as the distance between stage and listener increases.

Fig. 3 Circular *(Omnidirectional)*

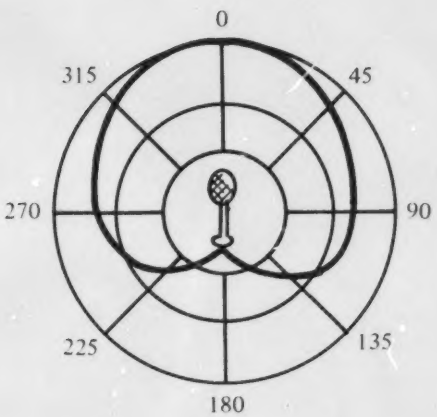
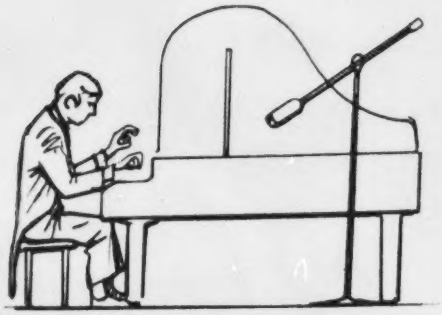


Fig. 4 Cardioid *(Directional)*



Place microphone to amplify the instrument, not the instrumentalist

Two people or two instruments of equal sound production intensity can share one microphone.

Place the single microphones or microphone/transmitter behind the conductor. He has already arranged the orchestra seating so that he hears the blend.

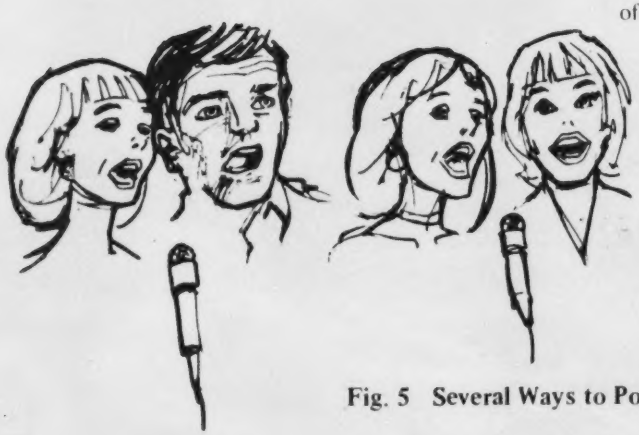
Hanging microphones over the first few rows, in the center of the "horn," can provide "the best seat in the house."

Groups can be arranged in pairs, using one microphone for each pair.

Fig. 5 Several Ways to Position Microphones

On occasion, visiting production companies or soloists will bring their own amplification systems. In some cases, only the soloist and/or a few instruments are amplified. Back-up musicians and often the entire orchestra are left unamplified. The audience hears a mixture of amplified and unamplified sounds.

In instances where the FM microphone/transmitter is used alone, it does not take a feed from the performer's amplifier because the resulting signal for the hearing impaired will be an unbalanced portion of what the rest of the audience hears. It is better to find a microphone position at which the amplified and unamplified sounds blend in a way similar to the sound reaching the audience. It may help to imagine the microphone at the apex of a triangle; the speaker is at one point of the base and the unamplified musicians are at the other point. Move the microphone closer or away from one point to the other, depending on the relative intensity of the sound (Fig. 6).

Even if a house system and better microphones are available, similar care should be taken in placing the microphones. Make sure that the mixer/amplifier components feed only the FM transmitter and that the house speaker system is turned off. Otherwise, feedback squeal or echo effects may occur.

Question: **How does an FM microphone/transmitter hook up to a mixer/amplifier?**

Answer: The microphone component of the microphone/transmitter units were designed for speech pick-up. These microphones, as a result, have a rather narrow dynamic range that does not accommodate the full range of music.

Another compression circuit built into the amplifier section of the transmitter prevents system overload by limiting the amplitude of the signal. At a level of intensity predetermined by the manufacturer, the transmitter goes into compression. This compresses the signal unit and its peak amplitude is reduced below the preselected level. The whole signal remains compressed until the peaks fall below the compression level, at which time the compression circuit disconnects, since all of the signal now falls within the range of acceptability.

The FM microphone of a microphone/transmitter unit usually designed for speech input goes into compression at an audio level of approximately 98 dbspl. The music of an orchestra frequently exceeds this level, drawing the unit in and out of compression. The result is an unacceptably distorted signal.

The solution lies in bypassing the microphone component of the microphone/transmitter.

The microphones feed to the mixer/amplifier and then by a direct lead to the auxiliary input of the microphone/transmitter.

A direct line link from the mixer or amplifier to the auxiliary input of the FM microphone/transmitter automatically disconnects the external microphone. One advantage of using the better quality microphone and amplifier system frequency range is lower distortion at high intensities. Compression distortion in FM units for the auxiliary input, which links the mixer to the transmitter, occurs at approximately 100 milliwatts. Therefore, a speaker output lead from the amplifier, which

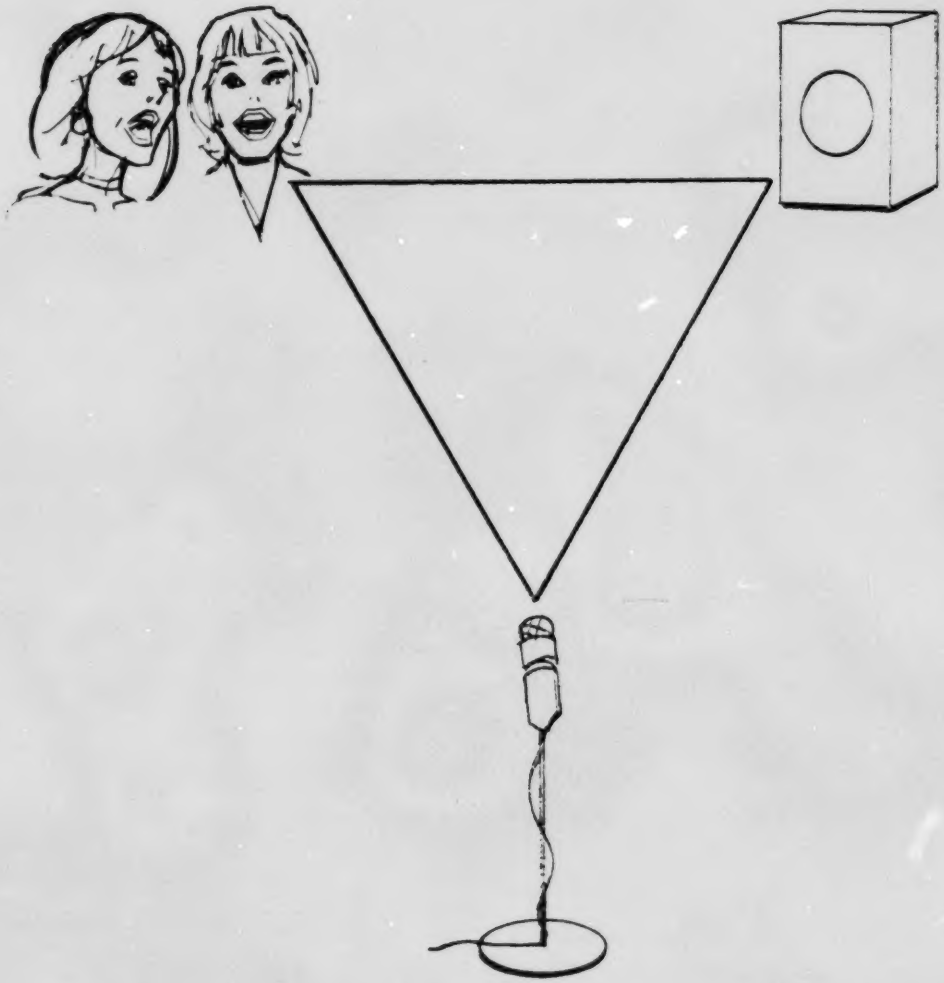


Fig. 6 Microphone Placement to Insure Proper Sound Blend

typically provides a 20 to 50 watt signal, is incompatible with the FM system. A "monitor" output lead, *e.g.*, for headphone monitoring, from either the mixer/preamplifier or amplifier stage may be acceptable if this provides a stepdown of wattage to less than 100 millivolts. If this is available, a direct line link to the auxiliary input of the FM transmitter can be used. The linkage must be two strong (coaxial) cables (balanced signal). Some units require a standard 1/8" diameter miniphone plug connection. Other may use a different patch plug, 3/32" in diameter, standard micro-miniphone plug. When a stepped down output is not available, the amplifier output can be reduced by use of an attenuator pad inserted between the output and the coaxial cable. This must be sufficient to reduce the current to below the required impedance value (see Figs. 7 and 8).

Question: **Where should the FM microphone/transmitter be placed?**

Answer: The microphone/transmitter, matched to the mixer, may be placed either on or off stage. Three criteria dictate placement:

1) The microphone/transmitter should not be blocked by cement or steel walls (such as are to be found in the proscenium of the stage).

2) Cables from the mixer to the microphone/transmitter must not pass near heavy electrical cables, which might cause electrical distortion.

3) The microphone/transmitter unit must not be placed near heavy electrical equipment or cables, such as lighting dimmer panels.

Question: **Is interference a possibility?**

Answer: Yes. Potential sources of distortion include:

1) Defective fluorescent lighting ballast tubes

2) Stage lighting lamps (bulbs) which, if deteriorating, oscillate and emit a radio frequency interference.

Question: **Is it possible to broadcast simultaneously on two frequencies?**

Answer: In some situations it may be desirable or necessary to broadcast on two frequencies. This would occur, for example, if a second FM system of a different manufacturer were borrowed to expand capacity. Two transmissions require two microphone/transmitter units operating on two different frequencies. To achieve this, the signal from the amplifier can be split by using a Y adapting cable. The split leads are then fed to separate microphone/transmitter unit auxiliary inputs. This procedure increases impedance modestly. Compensation for the increased impedance can be achieved by shortening the length of the cable from the mixer to the microphone/transmitter.

It should be emphasized that it is not possible to broadcast through two microphones on the same frequency. Severe distortion of the signal would result.

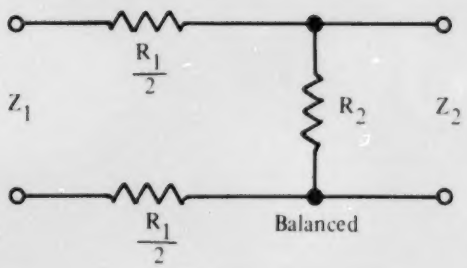


Fig. 7 Electronic Diagram for Audio Attenuator Pad

When Z_1 is 600 ohms
and Z_2 is less than 600 ohms

Z_2	500	400	300	250	200	150	100	75	50	40	30	25
R_1	245	346	424	458	490	520	548	561	575	580	585	587
R_2	1,225	694	425	328	245	173	110	80.2	52.2	41.4	30.8	25.6
db Loss	3.8	5.7	7.6	8.7	10.0	11.4	13.4	14.8	16.6	17.6	18.9	19.7

When Z_2 is less than 25 ohms,

$$\text{let } R_1 = 600 - \frac{Z_1}{Z_2}$$

$$\text{and } R_2 = Z_2$$

Where Z_2 is 600 ohms,
and Z_2 is greater than 600 ohms

Z_1	800	1,000	1,200	1,500	2,000	2,500	3,000	3,500	4,000	5,000	6,000	8,000	10,000
R_1	400	632	849	1,162	1,673	2,180	2,683	3,186	3,688	4,690	5,692	7,694	9,69
R_2	1,200	949	849	775	717	688	671	659	651	638	633	624	61
db Loss	4.8	6.5	7.6	9.0	10.5	11.6	12.5	13.3	13.9	15.0	15.8	17.1	18.1

When Z_1 is greater than 10,000 ohms,

$$\text{let } R_1 = Z_1 - 300$$

$$\text{and } R_2 = 600$$

Fig. 8 Tables of R_1 and R_2 Values

Question: **What are the maintenance requirements of this equipment?**

Answer: FM auditory training equipment is powered by rechargeable batteries. Typically, the receiver units are offered for sale in molded plastic charger boxes containing eight to ten units. The receiver units sit in charging pockets in the box when not in use. The charging pockets have battery charging contacts that mate with similar contacts on the bottom of the receiver unit. The charger box plugs into a standard 120 V A.C. line. Some charger boxes have timers that turn off automatically when the units are charged. The microphone/transmitters are also powered by rechargeable batteries. A small coaxial power lead from the charger box plugs into a power input in the microphone/transmitter. In the Phonic Ear microphone/transmitter, the charging input and the auxiliary sound input are the same. Special resistor and diode elements in the battery section of the microphone/transmitter prevent the battery power from running back out of the battery after it is charged.

Question: **Is more than one microphone/transmitter needed?**

Answer: Yes. No electronic equipment can work perfectly all of the time. Back-up microphone/transmitters are very important. If the one and only microphone/transmitter breaks down in the middle of a concert, the hearing impaired participants will be robbed of a very important experience at a time of heightened expectations. Back-up reserves of other equipment elements are also recommended. Extra hookup cables, fuses, batteries, mixers and amplifiers can prepare you for any emergency.

C) LOGISTICS

1) Funding

Question: **What are possible sources of funding?**

Answer: Listed below are several sources of funding. (A more comprehensive list is to be found in *A Guide to Resources,* developed by the National Committee* Arts for the Handicapped.)

a) *National and state agencies*

The major national and state funding sources will be familiar to the users of this booklet. They include the NEA National Committee on Arts for the Handicapped and state arts councils. Matching funds are usually a prerequisite for grants from these sources. Funding agencies respond most favorably when matching finances are provided from local sources. This demonstrates community support for the service. Since arts agencies are kept advised of funding sources at the federal and state levels, these are not discussed in this booklet.

b) *Local foundations*

Local foundations represent the primary local source of financial support. A detailed survey of all such agencies, large and small, is essential. A listing of these agencies should be available from the local Chamber of Commerce. Another valuable source for identifying local foundations

is the Foundation Center which provides a directory listing of foundations by state and geographic area.

c) *Service clubs*

Service clubs already identified as supporters of services to the hearing impaired population should be targeted first. These include Quota Clubs, International; Alhambra; and Sertoma. Other clubs that might be sympathic to your cause are the Lions, Kiwanis, Zonta and Altrusa.

Other clubs, exclusive to specific localities, should not be ignored. Service clubs do not always receive appropriate credit and visibility for their contributions to the community. Press coverage of their involvement in your project will often increase their support.

d) *Unions*

Local unions also constitute a potential source of funds. Like service clubs, unions also seek to establish good public relations within the community. Furthermore, many unions already have programs for their disabled members.

Question: **When is a project ready for major funding?**

Answer: A project is ready for major funding when

a) a detailed implementation plan, which shows a commitment to carry the program beyond the funding period, has been put together;

b) as assessment of community need has been prepared, showing that the largest population of people with handicapping conditions is the hearing impaired (these statistics will hold true in most conditions), and;

c) decisions have been made as to what equipment must be purchased, so that the necessary detailed budgets may be prepared for submission with the application.

This booklet will help you make many of these decisions.

2) Audience Development

Question: **Where will the hearing impaired audience come from?**

Answer: Hearing impairment is the largest single handicapping condition. The potential for developing an audience is great. It should also be recognized that many persons currently patrons of the performing arts will become hearing handicapped as a result of the aging process. The least expensive way to reach the hearing handicapped is through organizations already established to serve this population such as:

a) Clubs for the deaf

Clubs for the severely hearing impaired adult exist in many areas. They often are the only social facilities specifically designed to provide for the needs of this group of people. Bulletins containing information about the access program can be posted on the bulletin boards of these clubs and passed out at meetings.

b) Schools for the deaf

Schools for the deaf are not found in every area of the country. If one exists in your area, a liaison with the teaching staff should be established to develop an audience for special performances for children. Older teenagers and young adults should be encouraged to come to performances for children. Older teenagers and young adults should be encouraged to come to performances for the general public. Special student ticket rates should prove encouraging. Local service clubs and other philanthropic organizations can be persuaded to donate funds to purchase tickets for children and young adults.

c) Public schools special programs

The possibilities for child audience development discussed with reference to schools for the deaf apply to special programs run by public schools for hearing impaired children.

d) Organizations of parents of hearing impaired children

The parents of hearing impaired children are great advocates of making their children's experiences as normal as possible. They are usually willing to provide support and service. Parent groups can assist by picking up children who need rides and by providing supervision at concerts. It should be recognized that they will need full information on the auditory training equipment that will be used.

e) Senior citizens organizations

The largest sector of the hearing impaired population is the senior citizen age group. Many of these people have experienced a decrease in hearing late in life. They often attended and enjoyed performing arts events in the past but, with their growing impairment, are deprived of this esthetic and social pleasure.

f) Otologists, audiologists and hearing aid dealers

Many of these professionals will often allow flyers and pamphlets to be placed and handed out in their offices. They may also help by providing mailing lists.

As with any audience development target population, special rates for students, senior citizens and clubs, and group rates are important enticements. Many organizations respond favorably to an offer to provide a speaker and demonstrate equipment at their meetings. Finally, it is important to your project that you persuade the handicapped people you are trying to assist that they can participate in your activities.

3) Dispensing Equipment

Question: **How do patrons obtain instruments when attending performances?**

Answer: Patrons using amplification equipment fall into two categories, those registered with the service as regular users of amplification equipment, and those who request a trial use of a unit without notice.

Several criteria apply to both groups; some criteria are applicable to the walk-in patron only. The common criteria are:

a) The service to the hearing impaired patron should have a designated space for setting up equipment for fitting units to concertgoers.

b) The space should be clearly identified with basic information about the service readily available to preregistered participants and the walk-in public.

c) The pretested units should be laid out on a table or counter, together with forms acknowledging receipt of a unit. Each unit should be designated by an identification number taped onto the unit. Dymo labels have been found to serve this purpose well.

d) Earmolds should be available in a full range of stock sizes. These should be kept in a container with drawers each clearly marked to indicate left and right earmolds, and the size of the mold.

e) Cords with insert receivers should be suspended in rows from a notched piece of cardboard.

f) Neck loop induction cords, belthooks and harness straps should be laid out for use.

Question: **How are the instruments fitted?**

Answer: Patrons who have indicated that they want to use the units regularly should be audiologically evaluated. These participants in the service should have a card on file on which essential information is recorded. On arrival at the fitting area the patron gives his/her name. The patron's card is then pulled. It will identify

a) whether the patron brings his/her own personal molds;

b) whether a personal mold(s) is in the regular patron's mold storage unit;

c) the patron's preference for monaural right/left fitting, or for binaural fitting;

d) the appropriate sound pressure level and tone setting for the unit;

e) whether the patron prefers to use insert receivers or induction coil neck loop.

The client is issued the unit and accessories and then signs the receipt card. The client's seat number is recorded on the card. It is economical of time to provide each regular patron with careful instructions on the controls on the unit and how they should be set. Instruction should also be given on how to fit the earmold if the client is unfamiliar with this procedure. The units to be used by patrons participating on a season ticket basis can be pre-set to the patron's amplification specifications and coded for identification.

Walk-in clients wishing to try the unit should be required to complete an information form (Appendix 1). Each individual is carefully counseled concerning the purpose and function of the unit. It is suggested that successful use of unit is related to the satisfactory use of a personal hearing aid. Persons who, for various reasons, have not been able to tolerate the use of a hearing aid are unlikely to be satisfied with the FM amplification system. If a walk-in client uses a body-type aid with standard earmold, this can be used with the unit. If the patron wears an ear-level aid, a stock mold should be fitted. The induction loop neck accessory can be fitted if the patron's aid has a telephone switch.

Question: **Where can stock earmolds be obtained?**

Answer: Local hearing aid dealers may have some stock earmolds. If they do not they may suggest a preferred manufacturer. The best type to use for performing arts participation are made of flexible vinyl and can be fitted tightly but comfortably. A tight fit is essential to avoid feed-back whistle. Stock molds come in sizes 1 and 2 for children and 3, 4 and 5 for teenagers and adults.

Question: **Are the earmolds hard to maintain?**

Answer: No. The stock earmolds must be kept clean so the sound will be properly channelled to the ears. For reasons of good hygiene they should be cleaned with mild soap and water only – never use alcohol or solvents. If the earmolds become clogged with wax, gently push a soft absorbent cotton pipe cleaner through the opening to clear it.

Question: **How are units collected after the concert?**

Answer: Patrons are requested to return the units to the issuing area. Each unit is put back in the charger storage container unit. Any unit about which a complaint is made should be tagged with an adhesive red plastic disc for checking. The card with attached insert receiver unit should remain on any tagged unit since it will be necessary to test the complete unit as used. A neck loop accessory used with a malfunctioning unit also should be tagged. Earmolds should be removed from all insert receivers and kept separate for cleansing, sorting and replacing in the appropriate earmold storage drawers. Custom molds used by regular patrons are usually kept by the owners. However, if requested, the arts agency should be prepared to keep these in clearly identified envelopes. Great care must be taken to keep personal molds separate from stock molds. All molds should be cleansed each time in the manner described in Appendix No. 1.

Clients who wish to use the units frequently but who do not purchase season tickets, should be advised to obtain custom earmolds. When purchasing tickets in advance, they should mail or call in reservations for equipment at least one week in advance.

Question: **Is special seating necessary?**

Answer: One of the greatest advantages of the FM system of amplification is that it permits open seat selection. Patrons should feel free to select any seat in the concert hall or theatre. However, in our experience, reception in balcony seats is less good than in seats on the lower floor.

4) Children's Performances

Question: **How can we develop an audience of hearing impaired children?**

Answer: We recommend that at the beginning of the season, a letter identifying those concerts which will be amplified for children should be sent to all local special educational schools and agencies serving the hearing impaired. Cooperating school districts and agencies will also send notes home with the children encouraging parents to participate in this service. This double system of notification should ensure that no parents are missed. Parents who respond to the invitation to register with your project can then be contacted directly about future events suitable for children.

The experience of the Buffalo Philharmonic Orchestra has demonstrated that special children's concerts, mime shows, plays, etc. lend themselves to providing access services to hearing impaired children on a large scale. Such a service necessitates preplanning and a cooperative arrangement with participating educational agencies. Some school districts and cooperating agencies will have their own auditory training systems for use in classroom situations. A survey of FM systems used by potential participating organizations may reveal that one brand dominates a specific area. This is a consideration in choosing the type of system you will be using. If the systems are compatible, the schools can loan their own equipment to augment your system and in so doing increase the potential number of children you can serve.

School equipment may operate on different frequency crystals. The purchase of extra crystals on your own operating frequency will make them compatible with the performance frequency. A simple exchange of crystals before the performance will insure that the loan crystals are returned. To insure that no hearing impaired children are denied the opportunity to attend performances at which amplification equipment is available, local corporations and service organizations should be approached for ticket funding. The project advisory committee and participating schools and agencies can distribute the tickets. Meetings with the committee membership and other participants should be held prior to the concert. At that time specific logistical problems can be ironed out. Appendix No. 2 is a sample of logistical methods. Materials for teachers to use in preparing the children for the performance can also be passed out at these meetings. Story lines, words to songs, pictures, program notes on composers and music themes are all useful materials to a teacher. Transportation of the children is another logistical concern the committee should consider carefully.

5) Program Assessment

Question: **What factors should be included in an assessment of program effectiveness?**

Answer: To assess the effectiveness of the access program, every coordinator should evaluate the following:

a) reliability of equipment;
b) efficiency of service;
c) the cost of the service;
d) cooperation with other agencies;
e) visibility of the service;
f) audience questionnaires.

a) *Reliability of Equipment*

Each microphone/transmitter and each receiver unit should be monitored for optimal function after each performance. An equipment log should be used in which all malfunctions are recorded. This log should have a page for each receiver unit and each microphone/transmitter. The log should record the date of malfunction, the nature of malfunction, action taken, problem diagnosed and date of return to service (see sample in Appendix 3). A separate section of the log should be reserved for a record of calibration data for each component. Calibration of each unit, complete with insert receiver, at the beginning of each performance is essential. Ideally, the arts agency providing the amplification service should have an electro-acoustic analyzer at its disposal. This allows for immediate recheck of any piece of equipment about which doubts arise. More practically, however, a contractual arrangement might be made with a speech and hearing center, university hearing clinic, or hearing aid dealer with capability for providing electro-acoustic analysis of the instruments.

Listening checks should be made on each receiver unit prior to each concert. This may be done by broadcasting a signal from a portable tape recorder through a back-up microphone/transmitter. This back-up microphone/transmitter must necessarily be of the same frequency as the one selected for concert broadcast, otherwise the receivers will not be tuned to it. To prevent interference, the concert microphone/transmitter must be off for pre-concert testing of units with the back-up microphone. Similarly, it is crucial that the back-up unit be turned off before the performance commences.

b) *Efficiency of Service*

Until the service is demonstrated by both hearing impaired participants and operators to be without significant impediments, a close monitoring system should be followed. This should include post-concert staff meetings and a post-concert questionnaire interview of patrons using the service. The project advisory committee should be encouraged to participate as volunteer operators and assist in problem solving. Their experience and professional expertise will be of great value in assuring smooth service.

c) *The Cost of the Service*

Normal cost accounting procedures should be applied to the access service. Analysis should include:

i) cost of equipment for basic service including electro-acoustic analyser equipment to check fidelity of units or the cost of contract services for this purpose;

ii) cost of equipment for service expansion;

iii) cost of monitoring maintenance of equipment;

iv) cost of replacement of equipment;

v) cost of personnel for operating the system;

vi) cost of publicity.

These costs should be set against income generated specifically for the purpose of the access program. Deficits necessarily will have to be accommodated by the agency's general budget. Ideally the operation of the program should ultimately be self-supporting through increased ticket revenue and fund-raising projects.

The following indicates the average cost (as of the time of publication) of the equipment needed for basic service. The cost of individual brands vary from this average, but all brands remain competitive.

Microphone/transmitters (consider buying at least two for back-up)	$ 330.00
Receiver units @ $355 each (an access project should start with at least 10 units)	3,550.00
10 unit charger	300.00
	$4,180.00

Accessories such as insert receivers and cables can push the cost of a basic monaural system to $4,500.00. Binaural systems can cost $5,000.00 to $5,500.00. These figures are only estimated averages of the major brands and are subject to change due to inflation. For precise quotes send inquiries to the manufacturers listed in Appendix No. 4.

d) *Cooperation With Other Agencies*

The providers of the service should establish mutual guidelines for the evaluation of cooperative efforts. These will include arrangements with hearing clinics or universities for hearing evaluations of participating patrons, school districts involved in sending children to selected concerts, group organizations serving the hearing impaired including parent associations, service clubs supporting the program, etc.

e) *Visibility of the Service*

Visibility of an access project of this nature is an important concern for project coordinators. Attitudes of both the normal hearing and hearing impaired public must be altered. Some hearing impaired will need to be convinced that this equipment will be of use to them.

Three major benefits derive from publicizing the service:

i) You will develop public awareness of your service. This will increase the number of patrons seeking to use it. Your contacts with the hearing impaired population will be direct, as persons read and hear about the service, and indirect, as they are informed about it by relatives and friends who were reached by your publicity.

ii) Your organization will gain recognition by the community for the service you are providing to hearing impaired persons. Other access services to disabled persons can also be publicized.

iii) Local clubs and other funding sources will be publicly acknowledged in the publicity. This will reward their support and increase the interest of other philanthropic groups seeking to contribute to worthy projects.

To reach potential hearing impaired patrons, it is helpful to have a small printed pamphlet which briefly and clearly describes your service and how to take advantage of it. A contact phone number should be included.

One or two copies of the brochure should be sent to area hearing aid dealers, hearing clinics and ear specialists' offices.

Publicity is generally available through local radio stations which are required to provide public service broadcast time, and through local press and TV stations which may be persuaded to cover the human interest aspect of your service. News releases for newspapers, newsletters and explanatory signs near the dispensing area all help to inform the public.

f) *Audience Questionnaires*

The best judge of the effectiveness of the service will be the hearing impaired patrons themselves. It is advisable to ask patrons to complete an evaluation questionnaire after performances, as they return their FM units. An example of one of the questionnaires used in the past by the Buffalo Philharmonic Orchestra is shown in Appendix No. 5. Remember that the Buffalo Philharmonic Orchestra was conducting research and needed to structure the questionnaire to fulfill the objectives of the research. Questionnaires should be designed to assess the effectiveness of the equipment, efficiency of service and to reveal problems that might otherwise go unnoticed.

At the end of each season you may wish to mail out a rather broader questionnaire to those who have used the service. This would include questions addressed to members of the patron's family seeking their evaluation of the service. A separate questionnaire can be sent out to the parents of children who have attended special

performances or concerts for children. A sample of the Buffalo Philharmonic Orchestra's questionnaire for parents can be found in Appendix No. 6. It is essential that these questionnaires go out to the parents immediately so they can ask their children the questions while the experience is still fresh in their minds.

Appendix 1
MAINTENANCE AND CARE*

Cleaning

Clean the FM Phonic Ear® teacher microphone/transmitter and student FM receiver(s) with a damp cloth before returning them to the charger.

Prolonged Storage

Clean and place the units in the carrier/charger case and close the lid. Avoid storing in high temperatures or high humidity.

Earmold Cleaning

The student's earmold must be kept clean so the sound will be properly channeled to the ears. Clean the earmolds with mild soap and water only–never use alcohol or solvents. If the earmolds become clogged with wax, gently push a soft absorbant cotton pipe cleaner through the opening to clear it.

Effects of Environment

Certain extreme environmental conditions may be detrimental to the performance of the FM Phonic Ear System. A little care and forethought will enable you to avoid environment related problems such as:

Extreme heat: Never leave the units resting on a radiator or near sources of high heat. Extreme heat can damage the equipment.

Extreme cold: The units will not be affected by extreme cold. However, battery performance might be reduced at temperatures below freezing; this would affect the acoustic output of the equipment.

High humidity: Do not expose the units to high moisture environments such as saunas, steam baths or showers. Moisture can damage the equipment.

In general, avoid dropping or subjecting the units to sharp blows, or immersing them in water.

*Reprinted by permission of the H.C. Electronics Co. Though reference is made to H.C. Electronics' Phonic Ear® System, the same rules of maintenance and care apply to other FM systems.

Appendix 2
PROCEDURE FOR H.E.A.R. PROJECT AT CHILDREN'S SERIES CONCERT

Ticket Distribution

School and educational agencies will receive tickets for the concert in the mail.

Transportation

Transportation will be provided by schools and educational agencies for the children for whom they are responsible. Some parents may be bringing children to the concert themselves. However, should for any reason a mainstreamed child need individual transportation, the Buffalo Philharmonic Orchestra HEAR project will endeavor to make arrangements for this. Please advise Buck Burdette, 885-0331, of any such need as soon as possible.

Arrival Time

Assisting teachers: when possible, teachers bringing school equipment are kindly requested to try to arrive by 1:30 pm to set up their table.

Children: Children should arrive between 1:40 pm and 2:00 pm to allow for time for fitting with FM units.

Reception

The entrance on Pennsylvania Street (the entrance used last year) leads directly to the area where fitting tables will be set up. For teachers and children being dropped off, this is the desired entrance since it has a driveway to the door.

Teachers and parents parking cars will be using the main carpark and will enter through the Porter Street entrance. They should proceed across the length of the lobby to the tables at the Pennsylvania Street entrance.

We will have a roped-off area by the tables to facilitate the fitting of individual children without crowding.

Equipment

The Buffalo Philharmonic Orchestra now owns 25 Phonic Ear Units and has 20 Telex units on loan.

We expect a maximum of 65 children.

Those schools or parents having Phonic Ear units are requested to bring them.

We use a brown crystal with a green dot. Unfortunately, we no longer have additional crystals. Therefore, if you have the brown-green dot frequency, please equip the units for this frequency. If you do not have this frequency, please bring as many units as you can equipped with the same frequency crystal and the matching microphone/transmitter. It may be necessary for us to arrange to broadcast on your frequency. Schools may wish to color code their units and microphone/transmitters for easy identification. We suggest:

continued next page

St. Mary's – red tape
BOCES I – yellow
BOCES II – green
LDP – black

Earmolds

Stock earmolds will be available from the BPO. We do request, however, that custom molds accompany any child who has molds compatible with our insert receivers.

Personal Aids

Where appropriate, personal aids will be placed in a plastic baggie and put in the child's pocket or pinned to his/her clothing.

Ushers

Volunteer ushers will be available to direct teacher and children to seats.

Seating

Auditory-oral children this year will be seated in a block of seats in the front center section to facilitate speech reading.

Children needing the services of a manual interpreter will be seated in the front left side section behind the first walkway.

Interpreters

A manual interpreter will be provided.

Post-concert Events

We have requested a post-concert event by the performers but have not yet received a response.

Collection of Equipment

Children will return to the tables where equipment was issued. Schools providing their own equipment will collect at their own tables.

Appendix 3
FM SYSTEM MALFUNCTION RECORD

Date

System Identification — *e.g.* Phonic Ear, Telex

Unit Component
- Mic Transmitter
- FM Receiver
- Cord
- Insert Ear Receiver
- Neck Loop
- Battery Charger

Unit Identification Number — Receiver No. 6

Date of Malfunction

Method of Identification
- Calibration check
- Listening check
- Failure during performance

Nature of Malfunction

Action Taken

Unit returned to service

Appendix 4
LIST OF MAJOR MANUFACTURERS OF AUDITORY TRAINING EQUIPMENT

FM Systems

Aurex "Sound Stage" and accompanying training aids, Aurex Corporation, 844 West Adams, Chicago, Illinois 60607

Biocoustics monaural wireless system, 12316 Wilkins Avenue, Rockville, Maryland 20852

Earmark Auditory Training System, 449 Putnam Avenue, Hamden, Connecticut 06517

EFI "Travel Ear II," Electronic Futures, 57 Dodge Avenue, North Haven, Connecticut 06473

HC 421 FM Phonic Ear of H.C. Electronics, 250 Camino Alto, Mill Valley, California 94941

Oticon Auditory Training System, P.O. Box 1551, Union, New Jersey 07083

Telex Direct Wireless FM System, Telex Communications, 9600 Aldrich Avenue South, Minneapolis, Minnesota 55420

Zenith Auditory Training System, 6501 West Grand Avenue, Chicago, Illinois 60635

Infrared Systems

Sennheiser, c/o Sound Associates, Inc., 424 West 45th Street, New York, New York 10036

Beyer Dynamics, Inc. 5-05 Burns Avenue, Hicksville, New York 11801

Appendix 5
HEARING IMPAIRED PATRON'S EVALUATION QUESTIONNAIRE

Name (print) _____ Signature _____

1. Unit number _____

2. Transducers used:

   one two

3. Earmolds used: (Circle)

   left 1 - 2 - 3 - 4 - 5

   right 1 - 2 - 3 - 4 - 5

4. Teleloop used:

   Yes No

_____ _____

Authorized signature Date

continued next page

Appendix 5 continued

Please check (✓) the following questions:

1. What volume setting did you use on the Phonic Ear?

   1___ 2___ 3___ 4___ 5___ 6___ 7___ 8___ 9___

2. Did you use the Phonic Ear for:

   Left ear ____ Right ear ____ Both ears ____

3. Did you hear any static (a crackling or hissing sound)?

   Yes ____ No ____ Sometimes ____

4. Did you hear any feedback (a humming or whistling sound)?

   Yes ____ No ____ Sometimes ____

5. Did the sound ever cut off and on?

   Yes ____ No ____ Sometimes ____

6. Was the music too loud?

   Yes ____ No ____ Sometimes ____

7. Was the music too soft?

   Yes ____ No ____ Sometimes ____

8. Could you hear all of the instruments?

   Yes ____ No ____ Sometimes ____

9. Did you use the environmental microphone on the Phonic Ear?

   Yes ____ No ____ Unsure ____

   If you checked Yes, did you use it

   Before concert ____ During concert ____ At intermission ____ After concert ____

10. Would you ever consider buying your own Phonic Ear?

    Yes ____ No ____ Maybe ____

11. General comments about the concert:

_____ _____

Authorized signature Date

Appendix 6
LETTER TO TEACHERS OR PARENTS AND POST-CONCERT EVALUATION FORM

Dear Parent or Teacher:

Enclosed is a post-concert evaluation form for parents and teachers of hearing impaired children who attended the Buffalo Philharmonic Orchestra's Children's concert on October 25. Any information you can give us will be helpful in planning for the next concert.

Sincerely yours,

Charles Burdette
Coordinator, Projects for the Handicapped
Buffalo Philharmonic Orchestra

continued next page

Appendix 6 continued

PROJECT H.E.A.R. POST-CONCERT EVALUATION FORM

1. Was transportation a problem? Yes__ No__
   Comments:

2. Were arrangements for receiving your children at the concert hall satisfactory? Yes__ No__
   Comments:

3. Were seating arrangements for your child or children suitable? Yes__ No__
   Comments:

4. Was the interpreter satisfactory? Yes__ No__
   Comments:

5. Was the placement of the interpreter satisfactory? Yes__ No__
   Comments:

6. Was the procedure for fitting and giving out amplification equipment successful? Yes__ No__
   Comments:

7. Was the procedure for returning equipment adequate? Yes__ No__
   Comments:

8. Were some parts of the concert more interesting than others to your child or children? Yes__ No__
   Comments (indicate interesting and uninteresting parts):

continued next page

9. Were your children restless? Yes__ No__

10. What percentage of the concert held your child's/children's interest?

    0% 10% 25% 35% 50% 65% 75% 100%

11. How old is/are your child/children? _____

12. Was the concert too long? __or too short? ____ (please check)
    Comments on length of concert:

13. Do you feel this was an appropriate concert for your child/children? Yes__ No__
    Comments:

14. Was there enough visual activity? Yes__ No__
    Comments:

15. Did your child talk about the concert afterward? Yes__ No__
    If so, to what degree, *i.e.*, how much and how long?

16. Which type of amplification did your child use?

    PHONIC EAR ____ TELEX _____

17. Was it satisfactory?
    Comments:

18. Did your child indicate a preference for one type of amplification? Yes__ No__
    If so, which one did he/she prefer PHONIC EAR ____ TELEX _____

Please use this space for any additional comments. Your opinions are welcome.

Thank you very much!

Appendix 7
ADDITIONAL SOURCES OF FUNDING

This listing was compiled in 1980. It may, therefore, be out of date in some cases.

ARTISTIC APPLICATIONS OF CETA: applications of CETA funds to art projects, and how to go about getting CETA funds. Free, but enclose a self-addressed stamped envelope. Alameda County Neighborhood Arts Program, 1214 Webster St., Oakland, California 94610.

ARTS MANAGEMENT: useful information about management, funding, corporate support, book reviews, and legislative and agency developments. Appears five times a year, and annual subscription rate is $10. Arts Management, 408 West 57th St., New York, NY 10019.

ARTS REPORTING SERVICE: twice-monthly summary of the top stories in the arts. Tells about grants available, those awarded. Also a convenient summary of straight news. Consists of 24 bi-weekly issues, and annual subscription rate is $42.00. The Arts Reporting Service, P.O. Box 1905, Suite 1615, Silver Spring, Maryland 20910.

BUSINESS COMMITTEE FOR THE ARTS, INC.: does not pass out names of people to contact, but if you would send a list of requirements with a folder or a description of your program, they will try to get it into the hands of people in the business community who might be willing to provide funds. For more information, call (212) 765-5980 or write 1700 Broadway, New York, New York 10019.

CATALOG OF FEDERAL DOMESTIC ASSISTANCE: lists federal domestic assistance programs, including who's eligible and how to apply. Consists of a basic loose-leaf manual with changes and additions sent to you during the year. Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Cat. No. PrEx2.20:997. (Price changes each year; 1980 catalog is $20.00.)

CORPORATE FUND RAISING: A PRACTICAL PLAN OF ACTION: a strategy for mounting a campaign to solicit contributions from local businesses. Covers the basic steps of a well-organized fund-raising campaign. Price is $12.50 from the American Council for the Arts, 570 Seventh Ave., New York, NY 10018.

COUNCIL FOR ADVANCEMENT AND SUPPORT OF EDUCATION: annual lists of corporations that match gifts to higher education. For more information, write CASE, One Dupont Circle, Suite 530, Washington, D.C. 20036.

CREATIVE ARTS AND HUMANITIES REPORT: lists more than 130 programs with deadlines falling within a six-week period. Divided between federal government and nongovernmental funding sources. Appears every six weeks and costs $68 a year. ARIS Inc., Pacific Medical Center, 2330 Clay St., San Francisco, California 94115.

CULTURAL DIRECTORY II: a classic reference book on federal assistance for the arts and humanities. The 1980 expanded edition contains descriptions of some 270 programs providing funds and services for the arts and humanities. Also 10 appendices containing addresses and phone numbers of regional and 232 other relevant offices of the Departments of Commerce, ED, HUD, and the Interior, and of Federal Information Centers, federal bookstores, and state arts agencies. Cost is $7.75. Smithsonian Institution Press, 1111 North Capitol St., Washington, D.C. 20560.

THE CULTURAL POST: official bi-monthly newsletter of the National Endowment for the Arts (NEA). Regular departments include news of NEA (including upcoming grant deadlines), legislation, book reviews, letters, and other sections of interest to artists and arts organizations. $6 a year. Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

DIRECTORY OF RESEARCH GRANTS: "up-to-date information about grant, contract and fellowship support programs available from Federal and State governments, private foundations, associations and corporations for research, training and innovative efforts." Published by Oryx Press, 3930 East Camelback Road, Phoenix, Arizona 85018 ($37.50 plus $1.25 postage).

ELHI FUNDING SOURCE: monthly publication serving elementary and secondary schools. A section for those especially interested in troubled children. Subscription costs $75.00 per year plus First Class postage and handling of $9.50. Can be ordered from Oryx Press, 3930 East Camelback Road, Phoenix, Arizona 85018; (603) 956-6233.

EDUCATION DAILY: independent daily national news service written for administrators on elementary/secondary levels. Covers activities of Congress, the White House, Federal Judiciary and Federal agencies. Published by Capitol Publications, Inc., Suite G-12, 2430 Pennsylvania Avenue, N.W., Washington, D.C. 20037. Annual subscription rate is $240.00, six-month rate is $135.00.

EDUCATION OF HANDICAPPED CHILDREN: independent bi-weekly news service on Federal legislation, programs and funding for special education. Published by Capitol Publications, Suite G-12, 2430 Pennsylvania Avenue N.W., Washington, D.C. 20037. Annual subscription rate is $240.00, six-month rate is $135.00.

EDUCATIONAL FUNDING RESEARCH COUNCIL NEWSLETTER: information for school administrators and grants coordinators regarding funding regulations for programs, pending legislation and general news for the education community. Published by Education Funding Research Council, 752 National Press Building, Washington, D.C. 20045. ($96.00 per year; full subscription including "Hotline" costs $186.00.)

5,123 EXAMPLES OF HOW BCA COMPANIES SUPPORTED THE ARTS IN '78 & '79: fifth edition of a series from the Business Committee for the Arts Inc. (BCA). Some 112 corporations, their subsidiaries and foundations are represented. Single copies are free. BCA, 1501 Broadway, New York, NY 10036.

FEDERAL GRANTS AND CONTRACTS WEEKLY: listing of grants programs for which new action has been taken. Lists selected project opportunities for the education community, proposal due dates, types of contracts, etc. Published by Capitol Publications, Inc., Suite G-12, 2430 Pennsylvania Avenue N.W., Washington, D.C. 20037. Annual subscription rate is $114.00.

THE FEDERAL REGISTER: all proposed and finalized rules and regulations. Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. ($75 per year, $45 for six months.)

FOUNDATION CENTER COMSEARCH PRINTOUTS: Art & Architecture (#46), Dance, Theater, & Performing Arts (#47), Music (#48), Museums (#49), Historical Projects (#50). A series of listings of grants of $5000 or more to organizations as reported to the Foundation Center by approximately 400 foundations. Produced annually, and 5 printouts (listed above) focus on grants to the arts and humanities. Each listing includes name of the foundation; size of the grant award; to whom it was made and for what. $11 for paper copies and $3 for microfiche. The Foundation Center, 888 Seventh Ave., New York, NY 10019.

FOUNDATION CENTER SOURCE BOOK PROFILES: four-page fact sheet on more than 500 of the largest foundations in the U.S., with information about how to apply, or not to apply. Tells background of the foundation, the number of grants, largest and smallest grant, general range of grants. Service costs $150.00 per year, which brings the subscriber 40-45 new profiles each month as well as updates on previously profiled foundations. Subject index on the grant making interests of all profiled foundations is also included. Foundation Center, 888 Seventh Avenue, New York, New York 10019. ($150.00 per year.)

THE FOUNDATION DIRECTORY: most used and most misused research tool for organizations and individuals seeking foundation grants. To get the most out of this directory, here are a few hints:

1. Read introduction thoroughly. Pay particular attention to the section on how to use the directory.
2. Foundation listings are those that meet the financial criterion, one-million dollar or annual grants of $500,000 or more. This section is arranged by state and within states, alphabetically by foundation. Information includes address, donor, date and place of incorporation, financial data, range of grants and names of officers and trustees.
3. Also included is a section of three indices-fields of interest, donors, trustees and administrators and foundations. These fields of interest are broad, so don't be misled.

For more current information, FOUNDATION CENTER INFORMATION QUARTERLY updates the Foundation Directory. Foundation Directory, 7th Edition, published by the Foundation Center. The Directory can be ordered only from Columbia University Press, 136 S. Broadway, Irvington, NY 10533. ($40 plus $1.50 postage and handling.)

FOUNDATIONS, GRANTS AND FUND RAISING, SELECTED BIBLIOGRAPHY: non-annotated listing of almost 300 publications which might interest fund raisers. The 67-page booklet costs $5.00 (plus tax for California residents), and can be ordered from GSM Publications Service, Graduate School of Management, University of California, Los Angeles, California 90024.

THE FOUNDATION GRANTS INDEX: list of grants made by the largest foundations in America. Annual edition is a compilation of the lists of grants published in the bi-monthly Foundation News. Grants are listed with amount of grant, name and location of recipient, description of the grant and the grant identification number. Computer-generated listings of the 1976 foundation grants in broad areas, including the arts and humanities, are available from the Foundation Center. Paper copies of the printouts in each subject category may be purchased for $10.00 plus postage and handling. Microfiche copies of the printouts are $3.00 per subject. Order from the Foundation Center, published by Council on Foundations, Box 783, Old Chelsea Station, New York, New York 10011. The bi-monthly rate is $20.00. The Foundation Grants Annual Volume can be ordered from Columbia University Press, 136 South Broadway, Irvington, New York 10533. ($20.00 plus $1.00 postage and handling.)

FOUNDATION GRANTS TO INDIVIDUALS (2nd ed.): lists 936 foundations which are divided into categories by types of awards. Each entry includes the name and address of the foundation, telephone number and contact person, list of directors, assets, figures on grant giving. Also included are articles on approaching foundations, and a bibliography of information sources to individuals. $15. The Foundation Center, 888 Seventh Ave., New York, NY 10019.

FUND RAISING MANAGEMENT: loaded with ads about direct mail lists, volunteer and donor recognition items, conferences, etc. One of the few commercial publications in the fund raising field. Published by Hoke Communications, 224 Seventh Street, Garden City, New York 15530. Bi-monthly.

FUNDING RESOURCES AND TECHNICAL ASSISTANCE FOR MUSEUMS AND HISTORICAL AGENCIES: identification and description of approximately 100 programs from 19 sources, mostly public sector, that provide funding and technical assistance to museums and historical programs. Programs are categorized by type of assistance. Each program description includes objectives, uses and restrictions, and information contacts. Also lists 50 national museum assistance agencies, and state and regional museum coordinators. $10. The American Association for State and Local History, 1400 Eighth Ave. South, Nashville, Tennessee 37203.

GRANTS AND AID TO INDIVIDUALS IN THE ARTS: 221-page paperback lists "most grants, prizes and awards for professional work in the U.S. and abroad, and information about universities and schools which offer special aid to students." Order from Washington International Arts Letter, Box 9005, Washington, D.C. 20003 ($13.95 pre-paid).

GRANTS FOR THE ARTS: comprehensive approach to arts grants. More than half of the 343-page book is devoted to chapters on government, foundation and corporate funding sources. The rest of the book deals with proposal development and the application process. A section of basic information sources from the field, and six appendices listing useful addresses. Price is $19.95. Plenum Publishing, 227 West 17th St., New York, NY 10011.

THE GRANTSMANSHIP CENTER NEWS: only magazine that deals with both public and private funding. Includes numerous how-to articles about obtaining grants, writing proposals, planning programs, managing non-profit organizations and developing resources, as well as news and information about deadlines, new grant programs, etc. Published six times a year by the Grantsmanship Center, 1031 S. Grand Ave., Los Angeles, California 90015. ($20.00)

THE GRANTSMANSHIP TRAINING PROGRAM: an intensive, one-week small group workshop. No more than 22 students in a class, emphasis is on developing an individual's skills (resource development, proposal writing, etc.), not just handing out information. Focus is on each person's program ideas, funding needs, budget preparation, organizational credibility. Literature of participants is critically analyzed and refined. Cost is $295.00, and includes services which extend beyond the week of training. Proposals can be sent to advisors to be critiqued. Participants can use the Center's library. West Olympic Boulevard, Los Angeles, California 90015. (213) 485-9094.

A GUIDE TO CORPORATE GIVING IN THE ARTS: reports on 359 corporations. Each entry includes information on art forms and types of cultural organizations supported, eligible activities, priorities and restrictions, and examples of organizations and activities supported. Other features include a corporate listing by state and by field of business, and other general information on corporate support for the arts. Cost is $12.50. American Council for the Arts, 570 Seventh Avenue, New York, NY 10018.

HIGHLIGHTS III: three useful discussions on proposal preparation, public relations and financial management. Essentially a transcription of a series of seminars for the arts organizations sponsored by the Arts and Business Council. Free. Arts and Business Council, 130 40th Street, New York, NY 10016.

HOW TO GET GRANTS TO MAKE FILES & VIDEO: ten federal and quasi-federal agencies; more than 90 private foundations and grant programs functioning on a national, regional or special-interest basis; and 24 sources of academic scholarships and fellowships, and media research grants. $14.95 plus $1 for postage and handling. Film Grants Research, P.O. Box 1138, Santa Barbara, California 93102.

HOW TO GET MONEY FOR: a series of four books, each of which lists potential funding sources for particular program areas. Description of funding sources include such information as address, deadlines, contact persons and funds granted.

1. Conservation and Community Development
2. Youth, the Elderly, the Handicapped, Women and Civil Liberties
3. Education, Fellowships and Scholarships
4. Drug and Alcohol Abuse and Health

Book Numbers 1, 3 and 4 are $5.95. Book Number 2 is $7.95. Order from Human Resources Network, 2010 Chancellor Street, Philadelphia, Pennsylvania 19103. Add $1.50 for postage and handling whether you buy one or several of the books.

HOW TO RAISE MONEY: SPECIAL EVENTS FOR ARTS ORGANIZATIONS: descriptions of 18 actual special events and notes on 13 other typical events connected with arts organizations. Price is $2.00. American Council for the Arts, 570 Seventh Avenue, New York, NY 10018.

HUMANITIES: bi-monthly tabloid published by the National Endowment for the Humanities (NEH), containing essays by well-known writers on issues affecting the humanities and featuring exemplary projects funded by the endowment. Includes a listing by category of recent NEH grants and forthcoming application deadlines. Subscription rate of $7.00 a year. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

INTERNAL REVENUE SERVICE FOR 990 AR'S: tax returns of foundations and their required 990's are supposed to list the corporation's assets and grants. The most extensive and most current foundation information within a given state is kept at each State Attorney General's office or at whichever state agency has responsibility for maintaining the records of non-profit corporations. The 990's may also be viewed at the Foundation Center libraries in New York and Washington, D.C., or at one of the Foundation Center regional collections which are located around the country.

LRC-W NEWSBRIEFS: the Lutheran Resources Commission's monthly Newsbriefs provide information about a variety of program areas. Published by the Lutheran Resources Commission – Washington, Dupont Circle Building, Suite 823, 1346 Connecticut Avenue, N.W., Washington, D.C. 20036 ($50.00 per year).

LOCAL GOVERNMENT AND THE ARTS: through a question-and-answer format, how to get started. Models of local organizing are described, along with funding. Appendices over a variety of items such as charts of organization, samples of resolutions, and a section listing people with practical experience in this area. Cost is $15. American Council for the Arts, 570 Seventh Avenue, New York, NY 10018.

MANAGEMENT CIRCULAR: basic rules for administering federal grants to private non-profit organizations. Includes sections on grant payments, matching shares, financial management systems, use of income generated by a grant, revising budgets, closing out a grant and more. Order from the Publications Office, Office of Management and Budget, 726 Jackson Place N.W., Washington, D.C. 20503. (Free)

MEDIA HANDBOOK FOR THE ARTS: how to go about building arts audiences; the various types of media outlets for promotion; how best to deal with them. Includes a short glossary of media jargon. Price is $1.00. Association of Community Arts Councils of Kansas, 112 West Sixth Street, Topeka, Kansas.

MONEYBUSINESS: GRANTS AND AWARDS FOR CREATIVE ARTISTS: large number of potential sources of support listed here. Each entry includes eligibility requirements, awards amounts, application procedure and deadlines. Cost is $7.00. Artists Foundation Inc., 100 Boylston Street, Boston, MA 02116.

NEA GUIDE TO PROGRAMS AND NEH PROGRAM ANNOUNCEMENT: the major sources of federal funds to the arts and humanities are the National Endowment for the Arts (NEA) and the Humanities (NEH). Each publishes an overview of its programs. Request the GUIDE from Information Processing Office, National Endowment for the Arts, 2401 E. Street, N.W., Washington, D.C. 20506. PROGRAM is published biennially. February 1980 is current announcement, available from the National Endowment for the Humanities, 806 15th Street, N.W., MS 351, Washington, D.C. 20506.

NATIONAL DIRECTORY OF ARTS SUPPORT BY PRIVATE FOUNDATIONS, VOLUME THREE: over 1200 foundations' addresses, officers, typical grants and fields in which they operate. Order from Washington International Arts Letter, P.O. Box 9005, Washington, D.C. 20003 ($45.00).

THE NATIONAL DIRECTORY OF GRANTS AND AID TO INDIVIDUALS IN THE ARTS: 2,032 sources for grants and aid of up to $10,000. Majority of entries appear to be for education rather than for professionals. Washington International Arts Letter, Box 9003, Washington, D.C. 20003 ($15.95).

OCULAR: information on funding sources for the visual arts. Funding source information is detailed and includes sources outside the United States. Cost to individuals is $12 prepaid, $15 billed; cost to institutions is $16. Ocular Publishing, 1549 Platte Street, Denver, Colorado 80202.

THE PARTNERSHIP OF CETA AND THE ARTS: six reprints from WORKLIFE magazine. The first article briefly describes examples of CETA cultural projects, and the collection closes with a description of the application process. Single copies are free while supplies last from ETA Inquiries Unit, Department of Labor, Room 10225, Patrick Henry Building, 601 D Street, N.W., Washington, D.C. 20213.

PRESENTING PERFORMANCES: A HANDBOOK FOR SPONSORS: covers a broad range of issues, including setting up the basic organization, dealing with performers, public relations, ticket sales, fund raising. The new edition of this handbook is revised, and material on summer festivals and fiscal management has been added. Appendices include sample bylaws, contracts, press releases, and a technical glossary. Price is $3.95. New England Foundation for the Arts, 25 Mt. Auburn Street, Cambridge, Massachusetts 02138.

PROPOSAL WRITER'S HANDBOOK, STEP-BY-STEP PROCESS: a training manual, with the objective to help plan, organize and write a conceptually sound proposal that will increase potential for funding. Cost is $2.50 each, prepaid to cover postage and handling, from National Association of State Directors of Special Education, 610-E, 1201 16th Street, N.W., Washington, D.C. 20036.

STANDARDS OF CHARITABLE SOLICITATION: guide to non-profit fund raising methods, advertising and public disclosure of financial operations. Director of Philanthropic Advisory Department, Council of Better Business Bureaus, Inc., 1150 17th Street, N.W., Washington, D.C. 20036. ($1.00)

SURVEYING THE ARTS IN SMALL COMMUNITIES: POLICY, BOARD AND STAFF; PLANNING OF THE ARTS: A COMMUNITY HANDBOOK: all three publications are part of the series Arteries Articles on Community Arts Development. SURVEYING outlines the rudiments of surveying small populations to determine their concerns with respect to the arts. POLICY provides an overview of arts administration. PLANNING is a useful introduction to the major concerns involved in arts planning at the local level. Illinois Arts Council, 111 North Wabash, Chicago, Illinois 60602.

TECHNICAL ASSISTANCE FOR ARTS FACILITIES: A SOURCE-BOOK: ideas for technical assistance in planning and designing physical plants for the arts. Tips to stimulate readers to develop their own sources. Published in 1977, the list of community design centers at the end may be outdated. Cost is $2.00. Educational Facilities Laboratories/Academy for Educational Development, 680 Fifth Avenue, New York, NY 10019.

TEN PREREQUISITIES FOR SUCCESSFUL FUND RAISING: ten suggestions with discussion of what should go into fund raising for college and community arts programs. Association of College, University and Community Arts Administrators, P.O. Box 2137, Madison, Wisconsin 53701. Cost is $4.00 for non-members, $3.00 for members.

UNITED STATES GOVERNMENT MANUAL: listing of every government department, agency, commission and quasi-governmental organization. Agency addresses, telephone numbers and names of key personnel are also listed. There is a paragraph at the end of most entries stating how more information can be obtained. Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. ($7.50) Issued annually.

WASHINGTON INTERNATIONAL ARTS LETTER: letter service and digest concerning 20th century patronage, support, programs and developments. For rates, write to Washington International Arts Letter, P.O. Box 9005, Washington, D.C. 20003. Published 10 times a year.

WHERE AMERICA'S LARGE FOUNDATIONS MAKE THEIR GRANTS: grants over $1,000 given by 515 large foundations. Amount, recipient, location and purpose included for each grant. Format is similar to the FOUNDATION DIRECTORY, with listings alphabetically by state and by foundations within each state. Grants are categorized under main purposes within each foundation. Must be used in conjunction with other sources. Can be ordered from Public Service Materials Center, 535 Lexington Avenue, New York, New York 10017.

PROJECT H.E.A.R. RESEARCH TEAM
Profiles

Ruth L. Spero, project director, is Executive Director of the BPO. Her training experience as a music therapist and university instructor in creative arts therapy make her particularly sensitive to the needs of the hearing impaired. It was her idea to create a special program for the hearing impaired that led to the research project subsequently developed by the team. Mrs. Spero has been a guide in determining the direction and parameters of research, developing the advisory committee, and obtaining the necessary commitment and cooperation of both State University of New York at Buffalo and St. Mary's School for the Deaf.

Charles Burdette, project coordinator, is Coordinator of Programs for the Handicapped for the Buffalo Philharmonic Orchestra. He is audio visual program specialist and has served as technical director and technical advisor in the Communications Department of both State University College at Buffalo and Niagara University. He is currently an adjunct advisor to the Communications Program at Niagara University. Mr. Burdette's major responsibility on Project H.E.A.R. has been to organize the activities of the research team. This has included planning logistics and educational development. He is also responsible for monitoring equipment during concerts, contacting schools, ticket arrangements, funding for disadvantaged students and publicity.

Derek A. Sanders, PhD, project counseling audiologist, is Professor of Audiology and Director of Audiology Training, Department of Communicative Disorders, State University of New York at Buffalo. He is a Fellow of the American Speech and Hearing Association, holds a Clinical Certificate of Competence in Audiology, and is a licensed audiologist. As consulting audiologist, Dr. Sanders has been primarily responsible for the measurement of hearing, application of amplification to the hearing impaired, and equipment calibration, including personal hearing aids of the participants. He has played a major role in design factors which necessitated specialized expertise in analysis of data on the hearing impaired.